# David Zhan

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## EDUCATION

**University of Pennsylvania** — May 2026

*Bachelors of Science in Computer Science, Masters of Science in Computer Science* — *GPA: 4.0/4.0*
- **Minors**: Mathematics, Data Science
- **Coursework:** Algorithms, Operating Systems, Cloud Computing, Distributed Systems, Networks and Protocols
- **Involvements** Penn Aerial Robotics (Software Lead), Machine Learning Research @ Penn, Teaching Assistant

## PROFESSIONAL EXPERIENCE

**Software Development Engineer Intern** — May 2025 – August 2025

*Amazon — PyTorch, AWS Bedrock/SageMaker/EKS/EC2, Kubernetes* — *Sunnyvale, CA*
- Designed and deployed a fully automated distributed data-distillation pipeline on AWS SageMaker and EKS for large-scale pretraining augmentation, increasing augmentation throughput by **30x**
- Developed a reasoning-centric data-augmentation methodology leveraging teacher-student distillation via AWS Bedrock, yielding **+2.6 pp** BBH-CoT and **+1.2 pp** MMLU-CoT improvements on Nova, Amazon's flagship LLM, using only **10 K** curated samples.

**Software Team Lead** — August 2024 – Present

*Penn Aerial Robotics — Python, ROS2, PX4, Gazebo* — *Philadelphia, PA*
- Led development of autonomous UAV vision systems, including a payload detection pipeline leveraging binary thresholding and contour analysis for real-time onboard inference.
- Directed simulation and hardware-in-the-loop testing in Gazebo and PX4 SITL to validate autonomous flight performance.

**Software Engineer Intern** — June 2024 – August 2024

*Ventoscity — Flutter, Swift, NodeJS, Typescript, SQLite* — *College Park, MD*
- Redesigned cross-platform mobile app using Flutter, achieving 20% faster load times and 30% smaller app size.
- Integrated AI-powered food scanning with 90% accuracy for portion sizes and fiber content analysis.
- Conducted extensive user testing with 100+ external participants implementing over 25 usability improvements, resulting in a 15% reduction in app crash rates.

**Software Engineer Intern** — June 2023 – August 2023

*National Science Foundation — Swift, SwiftUI, C++* — *College Park, MD*
- Developed a full-stack mobile app for emerging gut-health start up at UMD; pivotal in securing over $1M in VC funding.
- Submitted Publication to **Biosensors and Bioelectronics** (Second Author)

## PROJECTS

**Cloud Search Engine — *Java, AWS EC2, Distributed Systems*** — Dec 2025
- Implemented a custom **web server**, **distributed key–value store**, and a "mini-Spark" execution engine using only the `java.net` library
- Crawled and indexed **100k+ webpages** on an AWS EC2 instance, content in a fault-tolerant KVS
- Developed end-to-end processing pipeline for **TF–IDF**, **PageRank**, inverted indexing scoring to support keyword search
- Achieved **sub-second query latency** for terms via table partitioning, caching, and optimized distributed job scheduling

**PennOS — *C*** — May 2025
- Designed and implemented a UNIX-like operating system with a priority scheduler, file system, and interactive user shell; passed **100%** of kernel-level integration tests
- Implemented **round-robin** and multi-level **priority scheduling**, supporting preemption, background jobs, and concurrency with **zero deadlock cases** across 200+ stress tests
- Developed user-land utilities (shell, file I/O tools) and integrated a **virtual memory subsystem** with demand paging, reducing average page fault latency by **35%**

**Blip — *Next.js, Tailwind, TypeScript, ConvexDB, Clerk, OpenAI, Cerebras*** — November 2024
- Short-form audio social media platform encouraging micro-learning during transition periods of the day
- Out of **500+** participants competing, winner of **PennApps XXV: Best Entertainment Hack**

## PUBLICATIONS AND AWARDS

**Biosensors and Bioelectronics: X (Second Author)** — 2025

*Smart Underwear: A Novel Wearable for Long-Term Monitoring Of Gut Microbial Gas Production Via Flatus*

**PennApps XXV: Best Entertainment Hack** — 2024

**AIME Qualifier** — 2022

## SKILLS

**Languages**: Python, Java, C, C++, Go, JavaScript/TypeScript, SQL, Swift
**Backend & Systems**: Linux/Unix, Shell Scripting, Multithreading, Sockets, REST APIs, Distributed Systems, Concurrency
**Frameworks**: Node.js, Express, FastAPI, Flask, Django, React, Next.js
**Cloud & Infra**: Docker, Kubernetes, AWS (EC2, EKS, S3, Lambda, SageMaker, Bedrock), Nginx, Terraform